COMPLEX SYSTEMS (CSYS)

Courses

CSYS 095. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

CSYS 096. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

CSYS 195. Intermediate Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

CSYS 196. Intermediate Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

CSYS 205. Software Engineering. 3 Credits.
Treatment of software engineering problems and principles, including documentation, information hiding, and module interface specification syntax and semantics. Requires participation in a team project. Students awarded credit for CSYS 205 may not receive credit for CS 208 or CS 209. Cross-listed with: CS 205.

CSYS 221. Deterministic Models Oper Rsch. 3 Credits.
The linear programming problem. Simplex algorithm, dual problem, sensitivity analysis, goal programming. Dynamic programming and network problems. Prerequisites: MATH 122 or MATH 124; MATH 121 recommended. Cross-listed with: MATH 221.

CSYS 226. Civil Engineering Systems Anal. 3 Credits.
Linear programming, dynamic programming, network analysis, simulation; applications to scheduling, resource allocation routing, and a variety of civil engineering problems. Pre/co-requisites: Senior/Graduate standing in CEE or Instructor permission. Cross-listed with: CE 226.

CSYS 245. Intelligent Transportation Sys. 3 Credits.
Introduction to Intelligent Transportation Systems (ITS), ITS user services, ITS applications, the National ITS architecture, ITS evaluation, and ITS standards. Pre/co-requisites: CE 140 or equivalent; Instructor permission. Cross-listed with: CE 245.

CSYS 251. Artificial Intelligence. 3 Credits.
Introduction to methods for realizing intelligent behavior in computers. Knowledge representation, planning, and learning. Selected applications such as natural language understanding and vision. Prerequisites: CS 103 or CS 123; CS 104 or CS 124; STAT 153 or equivalent. Cross-listed with: CS 251.

CSYS 253. Appl Time Series & Forecasting. 3 Credits.
Autoregressive moving average (Box-Jenkins) models, autocorrelation, partial correlation, differencing for nonstationarity, computer modeling. Forecasting, seasonal or cyclic variation, transfer function and intervention analysis, spectral analysis. Prerequisites: CE 211 or CE 225; or CE 141 or CE 143 with Instructor permission. Cross-listed with: STAT 253.

CSYS 256. Neural Computation. 3 Credits.
Introduction to artificial neural networks, their computational capabilities and limitations, and the algorithms used to train them. Statistical capacity, convergence theorems, backpropagation, reinforcement learning, generalization. Prerequisites: MATH 122 or MATH 124 or MATH 271; STAT 143 or STAT 153 or equivalent; CS 110. Cross-listed with: STAT 256, CS 256.

CSYS 266. Chaos, Fractals & Dynamical Syst. 3 Credits.
Discrete and continuous dynamical systems, Julia sets, the Mandelbrot set, period doubling, renormalization, Henon map, phase plane analysis and Lorenz equations. Co-requisite: MATH 271 or MATH 230 or Instructor permission. Cross-listed with: MATH 266.

CSYS 268. Mathematical Biology & Ecology. 3 Credits.
Mathematical modeling in the life sciences. Topics include population modeling, dynamics of infectious diseases, reaction kinetics, wave phenomena in biology, and biological pattern formation. Prerequisites: MATH 122 or MATH 124 or MATH 230 or Instructor permission. Cross-listed with: MATH 268.

CSYS 295. Advanced Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

CSYS 296. Advanced Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.